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Fact Sheet
Indoor Air Toxics

What are indoor air toxics?

Indoor air toxics are toxic chemicals that can be found within buildings or vehicles. Although both chemical and biological contaminants found in indoor air may be toxic, the term "indoor air toxics" has been used within EPA to denote both those chemical contaminants listed in the Clean Air Act as hazardous air pollutants, or HAPs, and other chemical contaminants similar to HAPs.

Indoor air is a significant source of human exposure to toxic air pollutants. Most people spend about 90 percent of their time indoors. Over the past several decades, exposure to indoor air pollutants is believed to have increased due to a variety of factors, including the construction of more tightly sealed buildings, reduced building ventilation rates (to save energy), and the increased use of chemicals in synthetic building materials and furnishings and consumer and commercial products. Because concentrations of some toxic pollutants in indoor air tend to be quite different from (and often higher than) those outdoors, indoor air quality is an important component in determining public health risk from toxic air pollutants.

What are the sources of indoor air toxics?

Indoor air toxics may come from many sources, including outdoor air. Emissions from building materials, paints and coatings, adhesives, furnishings, carpet and other floor coverings, cleaning products, equipment and appliances, as well as other sources within the immediate area, produce indoor air contaminants. There are many sources of indoor air toxics in any home. These include combustion sources such as oil, gas, kerosene, coal, wood, and tobacco products; building materials and furnishings as diverse as deteriorated, asbestos-containing insulation, and cabinetry or furniture made of certain pressed wood products; products for household cleaning and maintenance, personal care, or hobbies; and outdoor sources such as radon, pesticides, and outdoor air pollution.

What affects exposures to indoor air toxics?

The greatest factors affecting exposures to air toxics indoors are the emission rates of air toxics from the products and materials used indoors, the length and frequency of product use, and the rate of ventilation within a structure (which affects both the dilution of air toxics produced indoors and the infiltration of air toxics from outdoors). In addition, many characteristics of the indoor environment directly affect the level of contaminants and the resulting exposure to occupants. Temperature and humidity can impact the emissions of some air toxics, such as the emissions of formaldehyde from pressed wood products. Other air constituents react with certain contaminants and dramatically affect

the composition of the indoor atmosphere. Contaminant interactions with each other and with the indoor environment itself affect the indoor air concentrations and contaminant exposure. The formation and release of contaminants within the same environment over time can change considerably.

What are we doing to assess public health risk from toxic indoor air pollutants?

While we recognize that indoor sources of air toxics emissions contribute to the total exposures that people experience for a number of toxic air pollutants, assessing these indoor sources of exposure cannot be done on a national scale at this time due to lack of sufficient data. These and other important aspects of total population exposures to air toxics will be addressed more fully over time as part of EPA's assessment activities.

Despite the fact that all of us are constantly exposed to a wide variety of low-level chemicals in the air we breathe, for practical reasons most exposure studies have traditionally measured only a single chemical (such as benzene) or single class of chemicals (such as VOCs). We therefore need to know more about the magnitude, duration, and frequently of actual exposures to real-world mixtures of toxic air pollutants. In addition, we need more information about the indoor sources of air toxics and about air movement (or ventilation rates) between the outdoor and indoor environments so that we can completely characterize human exposures, especially in urban areas. We need more information on indoor air exposures, including indoor/outdoor ratios of air toxics. Toxics can adsorb onto other items in the indoor environment and then be re-released later. Therefore, information on the potential sinks and reservoirs of air toxics would add useful information to the indoor characterizations of exposures.

We are supporting a number of studies to develop better data and models for toxic indoor air pollutants. These studies focus on human activity and personal exposure data, microenvironmental exposure measurements, and indoor source emissions. In the future, we'll use this information to update our risk assessment models and results.

Where can I find more information?

You can find a lot of information on indoor air quality on our website at http://www.epa.gov/iaq.